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भारतीय मानक

कंक्रीट के ब्लॉक निर्माण हेतु मशीनें —
सामान्य अपेक्षाएँ
(पहला पुनरीक्षण)

Indian Standard

CONCRETE BLOCK MAKING MACHINES —
GENERAL REQUIREMENTS
(*First Revision*)

ICS 91.220

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Price Group 3

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Construction Plant and Machinery Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was first published in 1992. Concrete blocks are commonly used in walls, partitions, roof, etc. This standard, covering requirements for size, operation speed and construction of concrete block making machines, has been formulated with a view to provide guidance both in the manufacture and the purchase of this type of machines. The experience gained in implementation of standard and revision/superseding of reference standards have necessitated this revision.

The composition of the Committee responsible for the formulation of this standard is given at Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the results of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CONCRETE BLOCK MAKING MACHINES — GENERAL REQUIREMENTS

(*First Revision*)

1 SCOPE

1.1 This standard lays down requirements for concrete solid and cavity block making machines of stationary and travelling type, having electrical motor driven vibration and travel mechanism (for travelling type) for manufacturing concrete blocks according to IS 2185 (Part 1): 2005 'Concrete mason units—Specification: Part 1 Hollow and solid concrete blocks (third revision)'.

1.2 This standard does not cover completely manually operated hand moulding sets.

2 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
2062 : 2006	Hot rolled low, medium and high tensile structural steel (<i>sixth revision</i>)
2932 : 2003	Enamel, synthetic, exterior: (a) Undercoating, (b) Finishing — Specification (<i>third revision</i>)

3 TERMINOLOGY

For the purpose of this standard, the following definitions shall apply.

3.1 Stationary Type — A concrete block making machine with frame fixed on ground or on an elevated structure. The blocks are laid on wooden or metal pallets to be transported either manually or mechanically.

3.2 Travelling Type/Egg Laying Type — A concrete block making mobile machine which lays blocks on a level platform on which it moves. The machine lays a particular number of blocks over the platform and moves further to lay another set of blocks, so as to cover the casting platform, in a continuous casting process.

3.3 Mould — It is a structural steel (*see* IS 2062) fabricated member for moulding concrete blocks of required shapes and sizes.

3.4 Ram — It is a structural steel (*see* IS 2062) fabricated member of complementary shape to the moulds with requisite tolerances for compaction of block concrete and for release of cast blocks from the moulds.

3.5 Machine Assembly — Structural assembly of the machine consisting of,

- a) main supporting frame to support the machine on platform and provide mobility mechanism for mobile machines;
- b) ram fixing frame; and
- c) mould fixing frame.

NOTE — The material of above frames shall conform to IS 2062.

3.6 Vibrator Assembly — Electrically operated vibrating mechanism fixed to the mould frame to produce dense blocks.

3.7 Tamping Arrangement — A form fitting arrangement to obtain compaction through ramming action and to provide required height to the concrete in the moulds after compaction.

4 DESIGNATION OF SIZES

4.1 Nomenclature of the parts of the concrete block making machine is identified in Fig. 1.

4.2 The sizes of concrete block making machines shall be designated by the casting size of the machine, in mm.

800 mm × 600 mm

1 000 mm × 600 mm

4.3 The intermediate and other sizes shall not be considered as standard sizes, although these may be supplied by mutual agreement between the purchaser and the supplier.

5 OPERATION SPEEDS

5.1 The machine travelling speed shall not be less than 15 m/min along the casting platform.

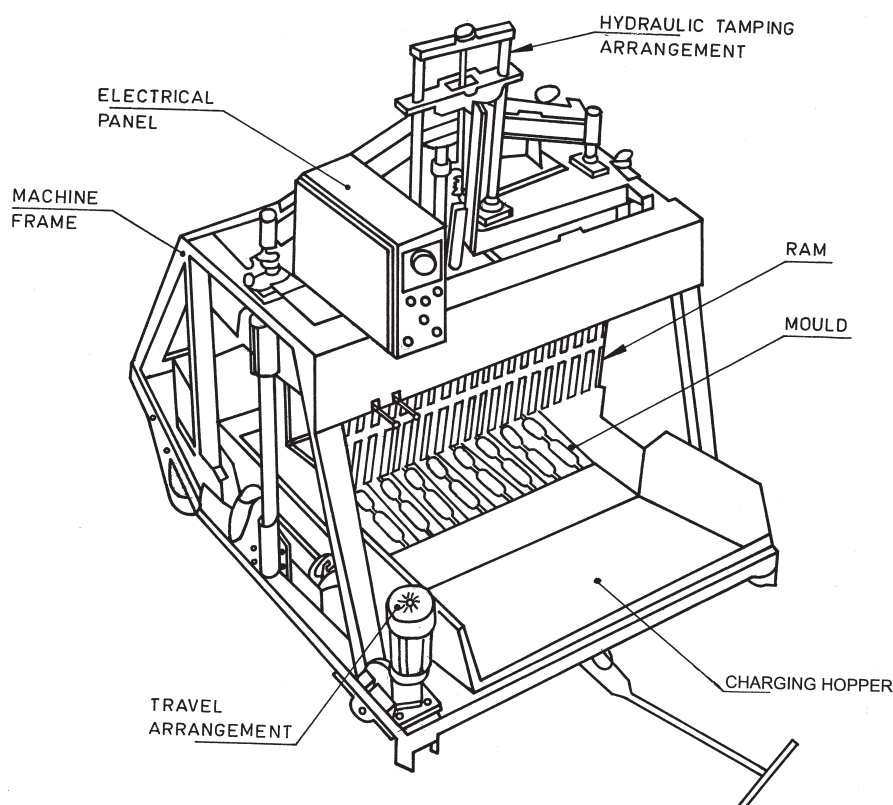


FIG. 1 A TYPICAL SKETCH OF CONCRETE BLOCK MAKING MACHINE

5.2 Casting Speed

Number of casting operations of the machine shall be between 40 and 55 numbers of casting of block operations per hour. The number of operations per hour shall be specified for each machine. The specifications for the motor shall be clearly identified.

6 GENERAL CONSTRUCTION

6.1 Besides vehicle chassis and the drive/driven mechanism, other main components of the concrete block making machines are hydraulic pump and its accessories, frame structures for mounting the moulds and the mould assembly. All sub-assemblies, including the charging hopper and mould of concrete block making machines of the same size manufactured or supplied under a specific contract shall be physically and mechanically identical.

6.2 All parts and components shall be provided with two coats of anti-corrosive primer and one coat of synthetic enamel paint or PVC paint (each of 30 μ thickness) before assembly of the concrete block making machine. The components shall be thoroughly cleaned for removal of rust, oil, grease, dust, etc, before application of primer coats. Second coat of synthetic enamel paint or PVC paint (30 μ thick) shall be applied on the machine after its final assembly. Synthetic enamel paints shall conform to IS 2932.

6.3 Ram frame shall be made from not less than 6 mm thick steel plates. The pockets for cavity shall be made from 3 to 4 mm steel plates. The edges and welds are dressed to remove burrs and irregularities so that the block contact surfaces are left cleaned and smooth. Steel plates shall correspond to IS 2062.

6.4 Block machine shall have normal provision for fitment and use of different moulds. The machine shall have versatility for production of different types of concrete blocks and allied products. The removal of one ram mould pair and fitment of another ram mould pair shall be easy and require minimum time.

6.5 The machines shall have provision for making adjustment to the fitment of ram and mould assembly so as to have proper level and alignment.

6.6 The frame of machines shall be manufactured from suitable steel sections and plates corresponding to IS 2062 with normal cares for welding and cleaning. The machine shall be capable of incorporating ram and mould assembly for block sizes which shall be as specified in the relevant Indian Standards.

6.7 The vibrations shall be approximately 6 000 vibrations/min. Amplitude of vibrations shall be as required for proper compaction of the blocks as per the mix used. Vibration arrangement shall have scope for adjusting amplitude of vibration by

adjusting the counter weights. The vibration spindles shall be rested on proper ball bearing to obtain smooth operation and belt vibrator with an electric motor as prime mover fixed to the main frame shall be used.

6.8 The travel of the ram shall be controlled so as to exert pressure on the concrete due to its travel till the correct height for the block is achieved. The height of the block shall be obtained by the ram assembly with the help of limit switches which shall cut off the power to the vibrator motor at appropriate time.

7 INSPECTION OF THE MACHINE

7.1 After assembly of the machine it should be checked for the following:

- a) Workmanship;
- b) Welding and cleaning of welds;
- c) Dry run of machine; and
- d) Sample moulding of blocks.

7.2 Sample Moulding of Blocks

The test is done to ensure that the blocks are cast without damage and with correct size.

7.2.1 The mould and ram are fixed to the respective frames and by trying movements the alignment is checked and adjusted, if necessary.

7.2.2 Platform for Trial

The trial is conducted on a concrete platform (or pallet) with good strength, surface finish and level.

7.2.3 The concrete is fed to the machine by spreader as in the actual use and one or two sets of blocks are cast to ascertain the concrete shape and dimensions. Any correction required is made immediately and more sets of blocks are cast till satisfactory results are obtained.

8 INSPECTION RECORD

A proper inspection record of the machine at the time of final testing is maintained as given in Annex A.

9 MAINTENANCE ACCESSIBILITY

9.1 Manufacturer shall provide operation and maintenance manual along with machine.

9.2 Ease of Maintenance

All major assemblies and installed attachments shall be accessible for maintenance, repairs and replacements without the removal of other major assemblies and installed attachments. Covers and plates which shall be removed for component adjustments, replacements and maintenance shall be equipped with quick disconnect fasteners.

10 MARKING

10.1 Each concrete block making machine shall have firmly attached to it a plate giving the following particulars:

- a) Name of manufacturer;
- b) Year of manufacture;
- c) SI No. of machine;
- d) Size of machine;
- e) Details and SI No. of electric motors; and
- f) Type of machine.

10.2 BIS Certification Marking

The concrete block making machine may also be marked with the Standard Mark.

10.2.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A
(Clause 8)
INSPECTION RECORD

A-1 BLOCK MAKING MACHINE TYPE

<i>Sl No.</i>	<i>Particulars of Inspection</i>	<i>Remarks</i>
i)	<i>General inspection:</i>	
a)	Welding and cleaning	
b)	Nuts, bolts and washer fitting	
c)	Adjustments for trough and height of block	
d)	General lubrication and gear	
e)	Painting	
ii)	<i>Ram and mould:</i>	
a)	Welding	
b)	Dimensional accuracy	
c)	Fixing arrangement and adjustment	
iii)	<i>Assembled unit:</i>	
a)	Various clearances required for operation	
b)	Smooth operation and correct alignment in dry run	
c)	Motors details and currents	

ANNEX B
(Foreword)

COMMITTEE COMPOSITION

Construction Plant and Machinery Sectional Committee, MED 18

<i>Organization</i>	<i>Representative(s)</i>
Ministry of Defence, CQAE, Pune	BRIG K. K. KAUSHAL (<i>Chairman</i>)
Airport Authority of India, New Delhi	SHRI G. K. CHOUDHARY SHRI R. L. SHARMA (<i>Alternate</i>)
Atlas Copco (India) Ltd, Pune	SHRI N. SAMBASIVAM
Bhai Sunderdass & Sons Co Pvt Ltd, New Delhi	SHRI BHAI TIRLOCHAN SINGH SHRI BHAI SWINDER SINGH (<i>Alternate</i>)
Bharat Earth Movers Ltd, Kolar Gold Field	SHRI H. M. MALLESH SHRI K. RAMESH KULKARNI (<i>Alternate</i>)
Britania Engineering Ltd, Kolkata	SHRI NIRMAL K. DASTIDAR SHRI SUBRATA GANGULY (<i>Alternate</i>)
Build Aids, Chennai	SHRI MOHAN RAMANATHAN
Builder's Association of India, Bombay	SHRI T. H. PESHORI
Caterpillar India Pvt Ltd., Chennai	SHRI PRAJEESH SANKARAN
Central Building Research Institute, Roorkee	SHRI S. K. SAINI SHRI D. K. GAUTAM (<i>Alternate</i>)
Central Public Works Department, New Delhi	SHRI K. K. SHARMA SHRI VIMAL KUMAR (<i>Alternate</i>)
Central Road Research Institute, New Delhi	DR P. K. NANDA
Central Water Commission, New Delhi	SHRI R. K. SINHA SHRI ATUL JAIN (<i>Alternate</i>)

Directorate General Border Roads, New Delhi	SHRI P. K. JAIN
Directorate General of Supplies & Disposals, New Delhi	SHRI K. C. JHA SHRI S. K. AGARWAL (<i>Alternate</i>)
Engineering Projects (India) Ltd, New Delhi	SHRI K. PAUL SHRI S. C. GANDHI (<i>Alternate</i>)
Engineer-in-Chief's Branch, New Delhi	SHRI R. A. DUBEY SHRI ARUL DAS (<i>Alternate</i>)
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Greaves Cotton Ltd, Mumbai	SHRI R. GANESH SHRI K. RAJ KUMAR (<i>Alternate</i>)
Indian Road Construction Corporation Ltd, New Delhi	SHRI M. N. SINGH SHRI A. SEN (<i>Alternate</i>)
Ingersoll-Rand, New Delhi	SHRI P. S. GYANI SHRI HARKESH JAGGI (<i>Alternate</i>)
Ircon International Ltd, New Delhi	SHRI S. K. GUPTA
L& T-Case Equipment Pvt Ltd, Pithampur	SHRI U. S. KULKARNI SHRI RAJIV SHALIA (<i>Alternate</i>)
L&T Komatsu Ltd, Bangalore	SHRI G. S. NARAYANA SHRI H. N. NAGARAJAARAYA (<i>Alternate</i>)
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Ministry of Defence, DGQA, New Delhi	COL S. SURESH COL V. V. KADAM (<i>Alternate</i>)
National Council for Cement and Building Material, Faridabad	SHRI SATISH SHARMA SHRI A. K. MISHRA (<i>Alternate</i>)
National Projects Construction, Corporation Ltd, New Delhi	SHRI R. P. CHOPRA SHRI S. M. GUPTA (<i>Alternate</i>)
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Speedcrafts Ltd, Patna	SHRI SHASHANK AGARWALA SHRI H. K. SHARMA (<i>Alternate</i>)
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Member Secretary
SHRI M. K. PARAMANIK
Scientist 'B' (MED), BIS

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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